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OFFICE OF  
ECOSYSTEMS, TRIBAL AND  
PUBLIC AFFAIRS

**CLEAN WATER ACT §401 WATER QUALITY CERTIFICATION**

**Removal Action of Contaminated Marine Sediments and Bank Areas at  
Slip 4 Early Action Area  
Lower Duwamish Waterway Superfund Site  
Seattle, Washington**

**I. Introduction**

This Clean Water Act §401 Water Quality Certification (WQC) is prepared in support of the Slip 4 Early Action Area (EAA) removal of contaminated marine sediment and bank material being conducted under the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended (CERCLA), within the Lower Duwamish (LDW) Superfund Site in Seattle, Washington. The Removal Action will address approximately 3.6 acres of contaminated sediments within Slip 4. A copy of this WQC and any future amendments will be placed in the Site File. In addition, copies of this original and any future amendments shall be kept on the job site and made readily available for reference by EPA, the contractor, and any other appropriate federal, tribal, state, and local inspectors.

The U.S. Environmental Protection Agency (EPA) is responsible for review of this project to ensure compliance with the substantive requirements of the Clean Water Act 401. We have drawn heavily on the State of Washington water quality standards (Chapter 173-201A WAC) in our evaluation, these standards being normally applicable and used by the State of Washington for Section 401 certification in the absence of a CERCLA action. The anti-degradation policy of the State of Washington, in addition to preservation of beneficial uses, is a factor in our analysis. While the State of Washington has no certification authority regarding this Removal Action, EPA has coordinated with the Department of Ecology, the designated water quality agency for the State of Washington.

This finding of compliance with the 401 WQC is based on our review of the project final remedial design documents, including the revised Design Analysis Report (DAR) and the revised Water Quality Monitoring Plan and Appendices (WQMP) (dated August 30, 2010). The Water Quality Monitoring Plan serves as the overall water quality monitoring plan for the project, though conditions of this certification shall supercede the WQMP unless specifically agreed to and documented in amendment to the certification by EPA. Should new or more specific information become available during planning and during implementation of the project, a revised/amended water quality certification will be prepared by the EPA, if necessary.

## II. Removal Action

Details of each project component are described in the referenced support documents. The following is a brief summary of the site and relevant actions.

Slip 4 is located on the east bank of the LDW, approximately 2.8 miles from the southern end of Harbor Island (see Figure 2-1). The slip is approximately 1,400 ft long, with an average width of 200 ft. The slip encompasses approximately 6.4 acres, from the head of the slip to the confluence with the LDW main channel. The slip is relatively shallow, with surface elevations ranging from +5 ft MLLW at the head of the slip to approximately -20 ft MLLW at the mouth. The shallowest depths occur at the head and along the eastern shoreline where the bottom relief gradually slopes to the current and historical dredging boundary located approximately halfway across the slip. At low tide, bottom sediments are exposed at the head and along the eastern shoreline. A pier owned by Crowley Marine Services is located on the western shoreline of the slip. Berthing areas are located at the mouth of Slip 4 and are currently used for barge loading and unloading. There are no other docks in Slip 4.

Slip 4 was identified as a candidate early action site within the LDW by EPA and Ecology based primarily on elevated concentrations of polychlorinated biphenyls (PCBs). EPA determined that Slip 4 meets the criteria for initiating a removal action under CERCLA and that this removal is non-time-critical. The Slip 4 EAA removal area boundary was determined by the distribution of PCBs which are the chemicals of concern (CoC) with the greatest aerial extent. The EAA boundary encompasses the distributions of other CoCs within the site. The defined removal boundaries encompass approximately 3.83 acres (see Figure 2-1).

The removal actions include dredging a minimum of 3-ft of material throughout the head of Slip 4 with disposal at an offsite upland commercial disposal facility, followed by capping of remaining sediments. Bank material along the shore of the Slip 4 will also be excavated. Based on the required depths and specified slope cutbacks, and with a 1-ft dredge overdepth allowance, the total estimated maximum dredge/excavation quantity is 10,256 cy. This includes 6,134 cy on bank areas and 4,121 cy in the mudflat area.

The primary objective of the removal action is to reduce the concentrations of contaminants in post-cleanup surface sediments (biologically active zone [0–10 cm]) to below the Washington State Sediment Quality Standards (SQS) for PCBs and other chemicals. The sediment removal action will significantly reduce unacceptable risks to the aquatic environment resulting from potential exposure to contaminants in sediments in the slip. This cleanup will also reduce potential human health risks associated with PCBs in sediment within the LDW.

The activities within Slip 4 associated with the removal action covered by this WQC include the following:

- Demolition of designated structures (Crowley pier)
- Removal of piles and debris
- Dredging of contaminated sediments

- Excavation of bank soils and sediments
- Return flows associated with dewatering of excavated/dredged materials
- Transloading of dredged and excavated materials from barge to land (i.e., to trucks), and associated management of return water (if any) from the transloading
- Placement of a sediment cap on the bed and side slopes of the slip in designated areas
- Placement of outfall scour protection.

### **III. Certification**

The EPA hereby certifies that the discharges associated with the Removal Action at the Slip 4 EAA in Seattle, Washington comply with the applicable provisions of Sections 301, 302, 303, 306, and 307 of the Act, as amended. This finding of compliance with the substantive requirements of the §401 Water Quality Certification is subject to the following terms and conditions:

#### **A. Expiration and Amendment**

1. This WQC shall become effective on the date it is signed and shall remain valid for one construction season, expiring March 31, 2012, unless specifically extended by EPA through amendment. Please note that in-water construction activities will be prohibited between February 15<sup>th</sup> and September 30<sup>th</sup> of any year, unless timing extensions are specifically coordinated and approved by the appropriate resource agencies
2. Prior to expiration, this WQC may be amended if there are significant additions, changes, modifications, and revisions to the Removal Action Workplan (RAW), the DAR or the WQMP.
3. The EPA contact person for amendments, modifications, approvals, or any other changes to this certification is Erika Hoffman, Environmental Review & Sediment Management Unit, Washington Operations Office (360)753-9540, Fax (360) 753-8080. Correspondence should be addressed by surface mail to WOO, 300 Desmond Drive SE, Suite 102, Lacey, Washington 98503.

#### **C. Reporting**

The EPA must be notified upon exceedance or failure to comply with conditions of this WQC as soon as possible. Reporting frequencies are detailed below. Typically, the EPA Remedial Project Manager (RPM) will be notified first and the RPM will then immediately notify the EPA Water Quality Specialist (WQS); however, the reverse may occur.

EPA Remedial Project Manager (RPM): Karen Keeley (206) 553-2141;  
keeley.karen@epa.gov

EPA Water Quality Specialist (WQS): Erika Hoffman, (360)753-9540;  
hoffman.erika@epa.gov

1. Pre-project: EPA's RPM shall be notified at least 2 weeks prior to the commencement of removal activities.
2. Daily reporting: Any water quality exceedances will be reported verbally or by e-mail to the EPA Remedial Project Manager on a daily basis.
3. Weekly reporting: Results from each week's Water Quality Monitoring Forms will be compiled into a summary table and provided electronically to EPA with the Weekly Progress Report. The exception to weekly reporting is the exceedance of a water quality certification condition, which must follow the reporting sequence outlined in Section 4.4 of the WQMP.
4. Final project report: Once all construction is complete, results for the entire construction period will be compiled and reported to EPA along with supporting documentation in the Water Quality Monitoring Report as part of the Removal Action Completion Report. At a minimum, the report must include, but not be limited to, the following information:
  - A description of field sampling activities and a plan view of monitoring locations relative to the location of removal actions;
  - Any deviations from the WQMP and reasons for the deviations;
  - Description of changes or contingency BMP's implemented to avoid or address water quality impacts;
  - A summary of field observations, including sampling times, weather conditions, water conditions, silt plumes, distressed/dying fish, and any relevant anecdotal or unusual observations;
  - Narrative and tabular text presenting results of water quality monitoring related to each operation ;
  - Discussion of water quality exceedances and any additional monitoring that may have resulted including rationale for selection/location of additional stations and/or discretionary samples;
  - Data quality review results based on calibration and precision/accuracy information, including any data qualifiers and reasons for those qualifiers ;
  - An appendix containing all completed water quality monitoring sample forms;
  - An appendix containing all calibration information ;
  - A list of all of the best management practices (BMPs) related to water quality that were employed during the project implementation, when and why those were used, and an assessment of the effectiveness of those BMPs.

#### **D. General Conditions**

1. Incorporation of other documents by reference: The Design Analysis Report and the revised Water Quality Monitoring Plan and Appendices (dated August 30, 2010) have been reviewed and approved by EPA. The contractor will submit a Removal Action Work Plan (RAWP) to EPA for review and comment. This plan should be consistent with and implemented in accordance with the terms and conditions of this WQC. Additions, changes, modifications, and revisions to the Plan by the contractor selected to do the work shall require prior

notification to and approval by EPA. If significant, the change will be documented and if necessary, an amended WQC will be prepared by the EPA Water Quality Specialist.

## 2. Fish Timing Window

In order to minimize potential chemical and physical impacts from suspended sediments to out-migrating juvenile salmonids utilizing the nearshore environment for migration and feeding, project in-water construction activities will be prohibited between February 15<sup>th</sup> and September 30<sup>th</sup> of any year, unless timing extensions are specifically coordinated and approved by the appropriate resource agencies.

## 3. Water Quality Standards

Compliance standards for all dredging and disposal activities are the Marine Acute State of Washington water quality standards (Chapter 173-201 WAC). Water quality standards pertaining to marine waters of the Duwamish River (“Good Quality”) shall apply to this project except within the temporary dilution (mixing) zone as defined below. All other applicable water quality criteria shall remain in effect within the mixing zone, and all water quality criteria are to be met outside of the authorized mixing zone (reference 173-201A-210 WAC).

- a. Dissolved Oxygen - At the point of compliance (edge of the mixing zone), DO shall exceed 5.0 mg/L. If background DO is lower than this criterion due to natural conditions, then the background condition minus 0.2 mg/L will replace the criterion (only for that period that background DO is lower). This standard is waived within the dilution zone but at no time should dissolved oxygen drop below 3.5 mg/L within the dilution zone. Should this occur, all in-water activities should cease immediately and EPA shall be notified. Work shall not recommence until dissolved oxygen levels have returned to ambient levels and approval has been given by EPA.
- b. Turbidity - At the point of compliance (edge of the mixing zone) turbidity shall not exceed 10 NTU over background turbidity when the background turbidity is 50 NTU or less, or have more than a 20 percent increase in turbidity when the background turbidity is more than 50 NTU.
- c. Total PCBs – The WA State Acute Water Quality Standard for PCBs is 10 ug/L.

If DO, turbidity or the acute water quality standard for total PCBs is exceeded at the point of compliance (edge of the mixing zone), the steps outlined in Section 4.4 of the WQMP must be followed.

## 4. Mixing Zone

For this project, the mixing zone boundary is defined using a fixed point located 100 meters (328 ft) southwest of the southern boundary of capping as indicated in Figure 2-1 of the WQMP (attached). Point of compliance measurements for all in-water construction activities shall be made at this location given the small size of the work area and the confined geometry

of the slip. This compliance sampling station has been located to minimize the influence of turbidity from storm drain discharges into Slip 4.

## 5. Water Quality Monitoring

EPA has approved the 100% design submittal Water Quality Monitoring Plan for this project (revised August 30, 2010) and this document is incorporated by reference as condition of this certification. Additions, changes, modifications, and revisions to the plan by the contractor selected to do the work shall require prior notification to and approval by EPA. Salient elements of the required monitoring are summarized below.

Timing and frequency of monitoring is keyed to the particular in-water activity as outlined in the Slip 4 Water Quality Monitoring Scheme (Table 2-1) in the WQMP. Timing and frequency of monitoring are intended to be representative of conditions during a given work day and to capture potential worst-case conditions for suspended sediments. During active dredging, it is expected that worst-case conditions will occur approximately 1-2 hours after a tide reversal. This is because a suspended sediment plume moving in one direction prior to the reversal will be superimposed on the plume being generated by ongoing dredging. During dewatering, worst-case effluent conditions will depend on the way dredging is proceeding, how well filter fabric and straw bales are being maintained, and how much water is mixed with sediment during dredging. The person directing field sampling must use discretion when determining timing of sampling on any given day, capturing worst-case operational conditions for dredging and dewatering, and doing so approximately 1-2 hours following tide reversal on a flood or ebb tide.

Activities automatically requiring water quality monitoring are:

- Sediment Dredging
- Barge de-watering
- Bank Excavation (in-water work only)
- Capping

Activities for which water quality monitoring may be conducted if they cause observable turbidity or sheen are:

- Demolition (in-water work only)
- Transloading of dredged material from barge to land
- Pile removal
- Placement of outfall scour protection

Three types of water quality sampling stations are envisioned as follows:

- One ambient station is located at the entrance of the slip and outside the influence of project activities.
- One compliance station is located at a fixed location, mid-slip and approximately 100m (328 ft) from the southern boundary of capping.
- Discretionary stations may be necessary if the compliance station indicates water quality exceedances are occurring. The rationale for taking discretionary stations

should be clearly indicated in field notes. Discretionary stations can be used to track and document the nature and extent of any plume associated with exceedances as well as identify the source of a plume or exceedance.

Water quality measurements/samples will be taken at two sampling depths: near-surface (approx 3 ft below the water surface) and near-bottom (approx. 3 ft above mudline).

Conventional *in-situ* monitoring parameters shall include:

- Dissolved Oxygen (DO)
- Turbidity
- Temperature
- Salinity

Analysis performed on water grab samples shall include:

- Total Suspended Solids (TSS)
- Total PCB (Aroclor)

#### 6. Water Quality Exceedance

In the event the water quality monitoring field staff/coordinator detect a water quality exceedance at the *in situ* compliance monitoring station, the Water Quality Response Mechanisms sequence outlined in Figure 4-1 of the WQMP must be followed.

In the event that water grab sample chemistry results detect an exceedance of the acute criteria for total PCBs at the compliance monitoring station, the following sequence must be followed:

- a. Immediately alert the quality assurance officer and EPA following receipt of lab results.
- b. Compliance boundary concentrations will be compared with those at the upstream ambient station to evaluate whether concentrations may be elevated as a result of the Removal Action, or may reflect area-wide water quality conditions. Removal Action operations may continue during this review.
- c. Follow-up water quality grab samples will be collected within 24 hours at the compliance boundary and the upstream ambient station, and submitted for analysis with a maximum 48 hour turn-around time. Additional water quality *in situ* and chemistry grab samples may be taken at the discretion of the City of Seattle's Quality Assurance Officer (QAO) and EPA to gain additional information about the size and location of any identifiable plume or potential source. Depending on the discussions/results of the deliberation in b. above, Removal Action operations may continue, may be altered, or may be halted pending the results of the additional testing. Pending receipt of the follow-up testing results, the contractor will assemble

a list of recommendations for addressing the exceedance if it is still found, during the follow-up testing.

- d. The QAO and EPA will be notified of follow-up testing results. If concentrations in the follow-up monitoring indicate continuing exceedances of water quality criteria caused by the Removal Action, the QAO, the Resident Engineer and EPA will confer concerning additional sampling, implementation of operational controls, and/or re-evaluation of the compliance boundary for water quality chemical criteria.

## 7. Effects on Fish

If during in-water activities, distressed and/or dying fish are observed in the construction vicinity, EPA must be immediately notified of the condition. The operator shall collect fish specimens and water samples in the affected area and, within the first hour of such conditions, have the water samples analyzed for dissolved oxygen and total sulfides. For distressed or dying fish the following, at a minimum, will be noted:

- Condition of fish (dead, dying, decaying, erratic or unusual behavior)
- Number, species, and size of fish in each condition
- Location of fish relative to operations
- Presence of any apparently healthy fish in the area at the same time
- Whether the species is a listed species

Additional water quality measurements may need to be taken at the discretion of the QAO and EPA, and are intended to define the area of impact and assess the situation to allow informed decisions. The cause of any water quality problem will be assessed and appropriate measures (e.g., change production rates, modify work schedule, perform work on a slack tide, etc.) will be taken to correct an identified problem.

## 8. Silt Plume

Routine water quality monitoring aside, if during in-water activities, a large silt plume (e.g., discoloration or turbidity) is observed in the vicinity of construction operations at any time, a description of the color, source, and size of the plume must be recorded, and potentially additional water quality measurements collected. EPA must be notified and decisions coordinated (as described in Section 2.1.2 of the WQMP). Any additional water quality measurements will be taken at the discretion of the Quality Assurance Official and EPA, and are intended to define the area of impact and assess the situation to allow informed decisions. The cause of any water quality problem will be assessed and appropriate measures (e.g., change production rates, modify work schedule, perform work on a slack tide, etc.) will be taken to correct an identified problem if project operations are determined to be the source.



#### 9. Prevention of Spills

Reasonable precautions and controls must be used to prevent incidental and accidental discharges of petroleum products or other deleterious or toxic materials from entering the water as a result of any in-water activities. Materials such as sorbent pads and booms must be available on-site and must be used to contain and clean up petroleum product spilled as a result of the in-water activities. If significant oil sheen is observed immediate corrective actions must be taken to modify the operation to prevent further degradation, or the activity must cease. EPA must be notified of the situation.

#### 10. Material for Sand Capping

Clean, sandy material must be used, which is free from fines and suspendable material to the extent practicable, and free from contamination by petroleum products or toxic substances in toxic amounts. Prior to placement of the cap material, the EPA Project Manager must be provided with information regarding the location/source of the material and detailed specifications of this material, including chemistry and grain size information, to determine its suitability as a clean cap material.

#### 11. Debris Handling During Pier Removal

Any floating debris must be collected during construction and disposed of at a suitable upland location. BMPs to accomplish this could include booms for containment.

#### 12. Transloading of Dredged and Excavated Materials from Barge to Land

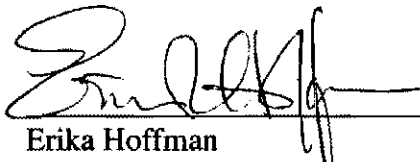
Absolutely no spillage of contaminated sediments or debris is allowed during offloading and/or transfer to the uplands.

### **E. Specific Conditions**

The Final Design Analysis Report and CQAP discuss potential concerns associated with each segment of construction, potential remedies and contingencies, best management practices, as well as inspection and monitoring associated with each element of this project. These are incorporated by reference here. The contractor submitted Removal Action Work Plan and action-specific plans (e.g., Dredging Plan) will provide further details and identify additional BMPs.

**Pre- and Post Construction Sediment Monitoring** – In order to determine what, if any, effects removal and construction activities have had adjacent sediments, a series of grab samples will be collected both before the commencement of activities and after the capping is completed. Grab samples (0-10 cm in depth) will be collected at 5-10 locations located 15-50 ft outside the south removal boundary. These samples will be analyzed for total PCBs and total organic carbon. The exact numbers, locations and COCs are to be determined in coordination with the EPA RPM.

PREPARED AND APPROVED BY:



Erika Hoffman

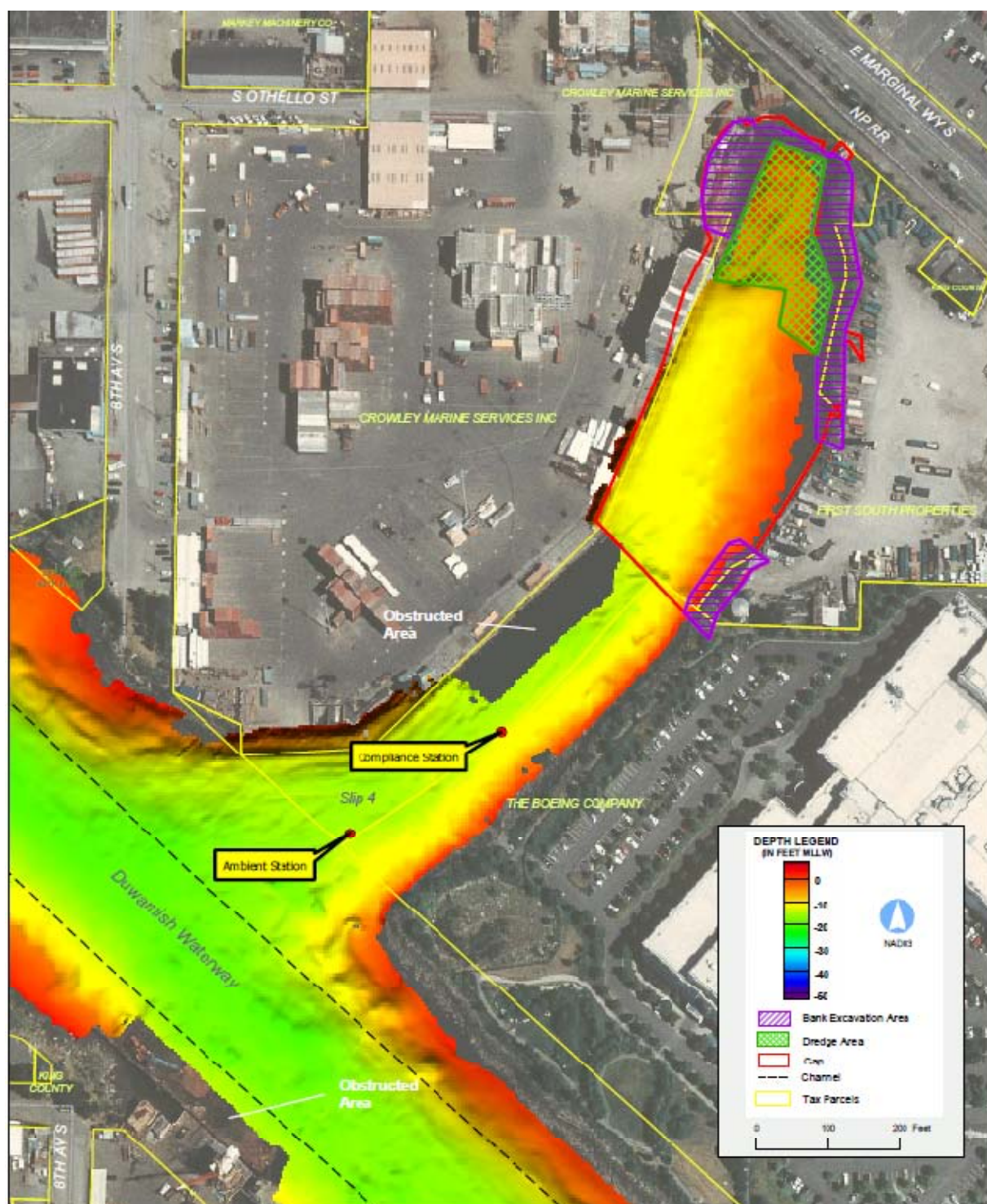
Environmental Review & Sediment Management Unit

5/23/11  
Date

cc:

Karen Keeley (EPA Remedial Project Manager)

Brad Helland (WA Dept. of Ecology)



integral  
solving it.

MAP PROVIDER SOURCE: KING COUNTY GIS, BENTLEY MICRO STATION, LIDAR, ECOLOGY, DAVID HARRIS & ASSOC., AND OTHERS.

Figure 2-1  
Water Quality Monitoring Stations  
Slip 4 Water Quality Monitoring Plan